

REMARKS

Reconsideration and allowance of this application are respectfully requested in view of the following discussion.

Applicants' invention concerns a process for producing a surface layer with embedded inter-metallic phases by providing a layer including a metal and ceramic and applying this layer to a substrate. Energy is introduced either during the application of the layer or subsequent to the application of the layer in such a way that a reaction takes place between the metal and the ceramic of the layer to form a resultant surface layer with inter-metallic phases. The process of the present invention is designed to improve upon prior art of the type described in the Background of the Invention. More particularly, the prior art uses a sintered porous ceramic body placed in die cast mold and infiltrated with aluminum under pressure. This method described at paragraph [0004] serves only to fill parts of the component and this affected the component regions which were subject to frictional loads. In another prior art process described in paragraph [0005], a design element was produced by molding, sintering and machining a ceramic body before it was infiltrated with aluminum. This process is complex and allows for a distinct transition between the layer and the substrate which is covered by this surface layer. This distinct transition has an adverse effect on the adhesion between the layer and the substrate component.

The present invention allows the reaction sequence to be controlled by the temperature and the duration of heating and these heating parameters can be used to have a controlling influence on the functional properties of the surface layer, as indicated at paragraph [0021]. Therefore, claim 1 specifically requires that, either during or after the application of the layer including the metal and ceramic, energy is introduced to provide the resultant surface layer with inter-metallic phases.

Claims 1-8 and 17 have been rejected under 35 U.S.C. § 102 as anticipated by the reference to Claussen, U.S. Patent No. 6,025,065, with reference being made to col. 4, lines 1-25, col. 6, lines 20-40 and Example 1. Claims 9-16 and 18-21 have been rejected under 35 U.S.C. § 103 as unpatentable over Claussen in view of Duffield et al., Jin et al., and Cliché et al. as detailed at the bottom of page 2 and the top of page 3 of the Patent Office Action.

Applicants submit that the reference to Claussen et al. '065 essentially corresponds to the prior art discussed above and in the Background of the Invention. That is, Claussen provides a powder mixture and a green body formed from a fine powder of aluminum in one or more ceramics. It is sintered in a non-oxidizing atmosphere in order to be converted into a completely crack free body. There is no indication of Applicants' claimed invention whereby a surface layer is formed by applying a first layer of a metal and a ceramic to a substrate element with heat being applied while the layer is being formed or subsequently in order to produce a resultant surface layer having inter-metallic phases. The reference to

Claussen does not provide such a layer and the use of powder formed by Claussen as a layer would appear to have the same potential problems with respect to not only adhesion to the substrate element but also the ability to effect the properties or control the properties of the layer. The forming of a powdery substance does not constitute the present invention. According to the present invention heat, which is not necessarily sintering heat, is applied either during the application to the substrate element or after application to the substrate element. No such process is shown or disclosed or suggested by Claussen.

With respect to the rejection of the dependent claims as being obvious over Claussen in view of the teachings of the secondary references, even if it is accepted that the references show the features set forth in the rejection, the secondary references add nothing toward meeting the claimed limitation of independent claim 1 from which all other claims depend and contain the limitations thereof.

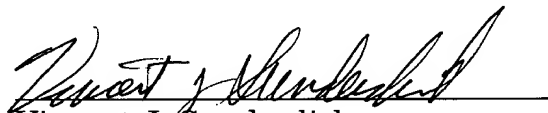
Therefore in view of distinction features between the claimed invention and the references which features are not shown or disclosed or made obvious by the references or their combination, Applicants respectfully request that this application containing claims 1-21 be allowed and be passed to issue.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #225/50216).

Respectfully submitted,

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